

What is claimed is:

1. A vision prosthesis comprising:
an optical element having a characteristic function associated with refraction therethrough, the characteristic function being selected to reduce aberration in an eye when the optical element is implanted at a location therein.
2. The vision prosthesis of claim 1 further comprising a modifiable part for selectively modifying the characteristic function of the optical element.
3. The vision prosthesis of claim 2 wherein the modifiable part comprises a wavefront component that is releasably attachable to the optical element, the wavefront component having a surface shaped to reduce the aberration in the eye.
4. The vision prosthesis of claim 3 wherein the shape of the surface is formed using wavefront-guided laser ablation.
5. The vision prosthesis of claim 3 wherein the wavefront component and the optical element have relative orientation features.
6. The vision prosthesis of claim 2 wherein the modifiable part comprises a memory element in the vision prosthesis, the memory element storing modifiable wavefront data selected to control an index of refraction profile of the optical element to reduce the aberration in the eye.
7. The vision prosthesis of claim 2 wherein the modifiable part comprises a deformable material whose shape is configured to change in response to an actuator.
8. The vision prosthesis of claim 1 further comprising:

a range-finder for generating, from a stimulus, an estimate of a distance to an object-of-regard;

an actuator in communication with the optical element for providing a signal that controls the focusing power thereof; and

a controller coupled to the rangefinder and to the actuator, for causing the actuator to generate the signal based on the estimate.

9. The vision prosthesis of claim 2 further comprising:

an actuator in communication with the optical element for providing a signal that controls the characteristic function thereof; and

a controller coupled to the actuator for causing the actuator to generate the signal based on wavefront data stored in a memory element of the controller.

10. The vision prosthesis of claim 9 wherein the signal is a parallel signal carried over a plurality of signal lines addressing a corresponding plurality of electrodes on the actuator.

11. The vision prosthesis of claim 9 wherein the characteristic function of the optical element changes in response to the signal by changing an index of refraction of material within the optical element at a plurality of locations.

12. The vision prosthesis of claim 9 wherein the characteristic function of the optical element changes in response to the signal by changing shape of a surface of the optical element.

13. The vision prosthesis of claim 9 further comprising:

a range-finder coupled to the controller for generating, from a stimulus, an estimate of a distance to an object-of-regard;

wherein the signal is based on the estimate, and focusing power of the optical element changes in response to the estimate.

14. The vision prosthesis of claim 13 wherein the characteristic function of the optical element changes in response to the estimate.

15. The vision prosthesis of claim 1 wherein the location in the eye is selected from the group consisting of:

the anterior chamber;

the posterior chamber;

the lens-bag; and

the cornea.

16. The vision prosthesis of claim 1 wherein the optical element is adapted for implantation in a phakic human patient.

17. The vision prosthesis of claim 1 wherein the optical element is adapted for implantation in an aphakic human patient.

18. A method comprising:

implanting an optical element into an eye;

measuring aberration in the eye when the optical element is implanted in the eye;

determining wavefront data based on the measured aberration; and

programming the wavefront data into a memory device in electrical communication with the optical element;

wherein a characteristic function associated with refraction through the optical element is designed to reduce aberration in the eye after the memory device is programmed.

19. A method comprising:

- implanting an optical element into an eye;
- measuring aberration in the eye when the optical element is implanted in the eye;
- shaping a wavefront component based on the measured aberration;
- inserting the wavefront component into the eye; and
- attaching the wavefront component to the optical element;

wherein a characteristic function associated with refraction through the optical element is designed to reduce aberration in the eye after the wavefront component is attached.